/L,3500

28638

S/020/61/139/006/003/022
C111/C333

AUTHOR: Prilepko, A. I.

TITLE: Uniqueness of the solution to the inverse problem of
             metaharmonic potential

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 6, 1961,
             1308-1310

TEXT: The function

$$v(M) = \iiint_T \varsigma(P) \frac{e^{-\lambda r}}{r} d\tau_P,$$

where $\varsigma(P)$ is the density of the potential, $\lambda = \text{const} < 0$,

$r = r_{MP} = \sqrt{(x-\xi)^2 + (y-\eta)^2 + (z-\varsigma)^2}$, $d\tau_P = d\xi\, d\eta\, d\varsigma$, is denoted

as metaharmonic volume potential of the body T.

Outside of T, V(M) is a regular solution of

Card 1/4

28639

S/020/6./1../006/003/022

Uniqueness of the solution to the . . . C111/C333

$$L(u) = \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} - \lambda^2 u = 0 \; ; \qquad (1)$$

inside of T -- solution of

$$L(u) = - 4\pi s \; (M) \; .$$

Let the bodies T_1 and T_2 with equal s (m) = 1 be simply connected and bounded by S_1 and S_2 respectively. Let S_α^i $(\alpha = 1, 2)$ be the interior part of S_α with respect to $\overline{T_1 \cup T_2}$; let $S^i = S_1^i \cup S_2^i$. Let S^e be the boundary of $\overline{T_1 \cup T_2}$ and $S_\alpha^e = S^e \cap S_\alpha$. The surfaces S_α $(\alpha = 1, 2)$ are assumed to be piecewise smooth. Assume that the centers of inertia of T_1 and T_2 lie in T_1 and T_2 respectively.

Theorem: If the z-axis (with the unit vector k) of the restangular

Card 2/4

28638

S/020/61/139/006/003/022

Uniqueness of the solution to the . . . C111/C333

coordinate system x,y,z can be chosen so that for the unit vector $\vec{v}$ of the exterior normal to S_α the condition

$$\int_{S^i} |\cos (\vec{k},\vec{v})| dS \leqslant \int_{S^e} |\cos (\vec{k},\vec{v})| dS \qquad (2)$$

is satisfied, and if the bodies T_1 and T_2 generate the same metaharmonic volume potentials outside of $\overline{T_1 \bigcup T_2}$, then T_1 and T_2 are identical.

The proof of the theorem uses the lemma:

If the metaharmonic volume potential of a mass with density ϱ (x,y,z) is identically equal to zero outside of the domain T filled by the mass, then every solution u(x,y,z) regular in T of the metaharmonic equation (1) which is bounded in the closed domain T satisfies the relation

$$\iiint_T u \varrho \, d\tau = 0 .$$

Card 3/4

28638
S/020/61/139/006/003/022
Uniqueness of the solution to the ...   C111/C333

The author mentions P. S. Novikov, L. N. Sretenskiy. J. T. Todorov
and D. Zidorov.

There are 3 Soviet-bloc references.

PRESENTED: April 7, 1961, by J. N. Vekua, Academician
SUBMITTED: March 21, 1961

Card 4/4

L 29138-65   EWT(d)   IJP(c)

ACCESSION NR: AP5004189   S/0020/65/160/001/0040/0043

AUTHOR: Prilepko, A. I.

TITLE: On the uniqueness of determining the form of a body from the values of an external potential

SOURCE: AN SSSR. Doklady, v. 160, no. 1, 1965, 40-43

TOPIC TAGS: potential theory, density function, uniqueness theorem, connectivity

ABSTRACT: The problem presented here is: let T_α ($\alpha = 1,2$) be connected regions, $\mu(y)$ - a function defined everywhere in the space E_n, $V_{T_\alpha}(x)$ - the potential determined by the body T_α with a given density $\mu(y)$. It is required to determine the relative locations of the regions T_α, the external potentials being equal. The potential is given in the form

$$V_{T_\alpha}(x) = \int_{T_\alpha} \mu(y) K(x, y)\, dy \quad (\alpha = 1, 2)$$

where $K(x,y)$ is the fundamental solution of the metaharmonic equation

$$\Delta u - \kappa^2 u = 0 \quad (\kappa = \text{const} \geq 0).$$

L 29138-65

ACCESSION NR: AP5004189

The following theorems are proved:

(1) For $\mathcal{H} = 0$, if there exists at least one point $0 \in (\bar{T}_1 \cap \bar{T}_2)$ such that (a) for a radius vector R_y passing through 0 and a unit vector n_y normal to the surface S_α at the point y, $(R_y, n_y) \geq 0$ for $y \in S_1^1$, S_2^1; (b) for a positive function $\mu(y) \in C^1$ in $(\bar{T}_1 \cup \bar{T}_2)$ the following condition is fulfilled:

$$\frac{\partial}{\partial \rho}(\rho^n \mu) > 0, \quad \rho \neq 0, \quad y \in (\bar{T}_1 \cup \bar{T}_1) \quad (n > 2);$$

and (c) for the regions T_α at the given density:

$$V_{T_1}(x) = V_{T_2}(x) \quad \text{for} \quad x \in E_n \setminus (\bar{T}_1 \cup \bar{T}_2),$$

then $T_1 = T_2$. A similar theorem holds for the case $\mathcal{H} > 0$. (2) If in the region G_α ($\alpha = 1,2$), it can be assumed that

$$\int_{G_1} \ln \frac{1}{r_{\xi_1}} d\eta = \int_{G_1} \ln \frac{1}{r_{\xi_1}} d\eta$$

for points $\eta \in E_2 \setminus (G_1 \cup G_2)$, then $G_1 = G_2$. (3) For $\mathcal{H} = 0$, if there exist a

Card 2/3

L 29138-65

ACCESSION NR: AP5004189

point 0, numbers γ, β, and a vector q such that: (a) for the surface S_α,

$$\int_{S_1} |\Phi(y)| d_v S + \int_{S_2} |\Phi(y)| d_v S < \int_{S_1'} |\Phi(y)| d_v S + \int_{S_2'} |\Phi(y)| d_v S,$$

$$\Phi(y) = (\gamma R_y + \beta q, n_v);$$

and (b) for the surface T_α at density $\mu = 1$

$$V_{T_1}(x) V_{T_2}(x), \quad \text{for } x \in E_n \setminus (T_1 \cup T_2),$$

then $T_1 = T_2$. Orig. art. has: 14 formulas.

ASSOCIATION: Institut matematiki Sibirskogo otdeleniya, Akademii nauk SSSR (Institute of Mathematics, Siberian Division of Academy of Sciences SSSR)

SUBMITTED: 29May64   ENCL: 00   SUB CODE: MA, GP

NO REF SOV: 009   OTHER: 002

Card 3/3

PRILEPKO, A.I.

Inverse problem of the metaharmonic potential for a body
close to a given one. Sib. mat. zhur. 6 no.6:1332-1356
N-D '65.   (MIRA 18:12)

LYUMKIS, S.Ye.; PRILEPKO, Kh.S.; MIMUKHIN, B.M.; SALOVA, K.P.

Surface active substances in the system matte - slag. Tsvet. met.
35 no.6:34-38 Je '62.   (MIRA 15:6)
                        (Surface active agents)

LYUMKIS S.Ye.; CHERMAK, L.L.; MIKUKHIN, B.M.; PRILEPKO, Kh.S.

   X-ray analysis of liquid heavy metal sulfide alloys. Izv.vys.
   ucheb.zav.; tsvet.met. 8 no.2:24-31 '65.
                                                  (MIRA 19:1)
   1. Kombinat "Yuzhuralnikel". Submitted February 28, 1962.

L 16047-66   EWT(d)/EWT(1)   IJP(c)   GW

ACC NR: AP6005131   SOURCE CODE: UR/0376/66/002/001/0107/0124

AUTHOR: Prilepko, A. I.

ORG: Institute of Mathematics, SO AN SSSR (Institut matematiki SO AN SSSR)

TITLE: Uniqueness of the solution to the external inverse problem of Newtonian potential

SOURCE: Differentsial'nyye uravneniya, v. 2, no. 1, 1966, 107-124

TOPIC TAGS: differential equation, Newtonian mechanics, potential theory, boundary value problem, gravity, gravimetric analysis, gravitational field, geophysics

ABSTRACT: The present report studies the problem of the uniqueness of the solution to the external inverse problem of Newtonian potential which is formulated as follows: E^n is an Euclidean space of n dimensions; $x = (x_1, x_2,..., x_n)$ and $y = (y_1, y_2,..., y_n)$ are points of this space; $r_{xy} = |x-y|$ is the distance between x and y; $d_x S$ or $d_x \sigma$ is an element of area of a $(n-1)$-dimensional surface at point x; ΓA is the boundary of the set A which is open in E^n; $\overline{K(\delta)}$ is a closed n-dimensional sphere with center at point x and radius δ; $K(x, y)$ is the fundamental solution of

Card 1/3   UDC: 517.917 : 947.42

L 16047-66

ACC NR: AP6005131

the Laplace equation $\sum_{k=1}^{n} \frac{\partial^2 u}{\partial x_k^2} = \Delta u = 0$ $\qquad$ (1)

(For example, $K(x, y) = \frac{1}{4\pi} \frac{1}{r_{xy}}$ for $n = 3$; $K(x, y) = \frac{1}{2\pi} \ln \frac{1}{r_{xy}}$ for $n = 2$). The Newtonian potential in the space E^n, $n \geq 2$, is characterized by the integral

$$V_T(x) = \int_T \mu(y) K(x, y) dy$$

where T may be a multi-connected region, or body, with given density $\mu(y) \neq 0$ almost everwhere for $y \in T$. Problem: Given T_α ($\alpha = 1,2$) finite regions (or open sets); $\mu(y)$ a function defined in the entire space E^n ($n \geq 2$); $V_{T_\alpha}(x)$ the potential determined by the bodies T_α with given density $\mu(y)$. It is required to determine the mutual disposition of the regions T_α for the condition that the external potentials are equal; that is

$$V_{T_1}(x) = V_{T_2}(x) \quad \text{для} \quad x \in E^n \setminus (\bar{T}_1 \cup \bar{T}_2).$$

This problem is related to the incorrect problems of mathematical physics, because in its reduced statement, generally speaking, it possesses no unique solution. Clarification of the supplementary conditions that ensure the uniquness of solu-

Card 2/3

L 16017-66

ACC NR: AP6005131

tion of the indicated problem has important significance in modern geophysics. The present work contains a number of new theorems governing the uniqueness of solution of the problem for various limitations on the regions. A brief communication of part of the results of the present report was published in DAN SSSR (160, No 1, 40-43, 1965). The demonstrated theorems yield the results of other works. Orig. art. has: 53 formulas.

SUB CODE: 12/
            08/   SUBM DATE: 07Sep65/   ORIG REF: 027/   OTH REF: 002

Card 3/3

L 25908-66 , EWT(d)   IJP(c)

ACC NR: AP6011423   SOURCE CODE: UR/0020/66/167/004/0751/0754

AUTHOR: Prilepko, A. I.   19
                                                                      (b)

ORG: Institute of Mathematics of the Siberian Branch of the Academy of Sciences
SSSR (Institut matematiki Sibirskogo otdeleniya, Akademii nauk SSSR)

TITLE: On the uniqueness of a solution to an inverse problem represented by a first
order integral equation

SOURCE: AN SSSR. Doklady, v. 167, no. 4, 1966, 751-754

TOPIC TAGS: integral equation, uniqueness, partial differential equation

ABSTRACT: Let A represent an open set in the space $E^n (n \geq 2)$. The metaharmonic
potential which is everywhere dense in A with density $\mu(y)$ is represented by

$$V_\mu(x) = \int_\lambda \mu(y) K(x, y) dy,$$

where $K(x,y)$ is the fundamental solution of the metaharmonic equation

$$\Delta U - \varkappa^2 U = 0 \quad (\varkappa = \text{const} \geq 0).$$

It is required to determine the density $\mu(y)$ for the points $y \in A$ if the external

Card 1/2   UDC: 517.948

L 25908-66
ACC NR: AP6011423

O

potential $V_\mu(x)$ is known for the points $x \in E^n/A$. A class of densities is found for which the above problem has a unique solution. Two of these are shown to exist in the multiply connected domain T which pertains to the class $A^{(1,\lambda)}$. One of these exists for $\varkappa \geq 0$ and the other for $\varkappa = 0$. Two more are found when A is an open set of points with a finite number of limited domains. Once more, the first corresponds to $\varkappa = 0$ and the other to $\varkappa \geq 0$. This article was presented by M. A. Lavrent'yev, academician, on 1 July 1965. Orig. art. has: 21 equations.

SUB CODE: 12/ SUBM DATE: 01Jul65/ ORIG REF: 009

Card 2/2 BLG

PRILEPKO, Kh.S.

Manufacture of refractory crucibles. Biul.TSIIN tsvet.ret.
no.18:25 '57.   (MIRA 11:5)
          (Crucibles)

YUN'YEV, G.S.; PRILEPKO, M.Ya.; Prinimali uchastiye: KRASOVSKAYA, N.I., studentka; MACHKOVSKAYA, I.V., studentka; ...OLOVSKAIA, N.F., studentka; RESHETNIKOVA, I.L., starshiy laborant

Age-related dynamics of cardiac activity in laboratory mammals according to electrocardiographic data. Report No.1: Atrioventricular conduction interval and the heart rhythm. Vop. fiziol. chel. i zhiv. no.1:31-46 '60.   (MIRA 14:10)

1. Kafedra fiziologii cheloveka i zhivotnykh Belorusskogo gosudar-stvennogo universiteta imeni Lenina.
          (ELECTROCARDIOGRAPHY)   (ANIMALS, INFANCY OF)

PRILIPKO, T.I., kand. med. nauk (Kiyev, Andreyevskiy spusk,d.15,
kv.20)

Treatment of sequelae of traumas of the locomotor apparatus
with artificial hydrogen sulfide baths. Ortop., travm. i
protez. 24 no.3:71-72 Mr '63.   (MIRA 17:2)

1. Iz Ukrainskogo instituta ortopedii i travmatologii
(dir. - dotsent I.P. Alekseyenko, nauchnyy rukovoditel' -
chlen-korrespondent AMN SSSR prof. F.R. Bogdanov).

SHEYNKMAN, A.K.; PROKOFSKAYA, A.N., KOLOMOYTSEV, L.P.; KOST, A.N.

Quaternary salts of 4-p-dialkylaminophenyl pyridinium. Vest.
Mosk. un. Ser. 2: Khim. 19 no.6:74-82 N-D '64.   (MIRA 18:3)

1. Kafedra organicheskoy khimii Moskovskogo universiteta.

PRILEPSKIY, A.

First results.   MTS   18 no.8:5-7 Ag '58.   (MIRA 11:9)

1. Glavnyy inzh. Belgorodskoy remontno-traktornoy stantsii, Belgo-
rodskoy oblasti.
          (Repair and supply stations)

PRILEPSKIY, A.G.

Reorganization of work in the handling of cars on the Krasnoyarsk
Railroad. Zhel.dor.transp. 43 no.3:67-71 Mr '61. (MIRA 14:3)

1. Nachal'nik sluzhby vagonnogo khozyaystva Krasnoyarskoy dorogi,
g.Krasnoyarsk.
        (Railroads--Cars--Maintenance and repair)

KOST, A.N.; SHEYNKMAN, A.K.; PRILEPSKAYA, A.N.

1-Alkyl-6-(4'-pyridyl)-1,2,3,4-tetrahydroquinolines. Metod.
poluch. khim. reak. i prepar. no.11:12-15 '64.

(MIRA 18:12)

1. Donetskiy filial Vsesoyuznogo nauchno-issledovatel'skogo
instituta khimicheskikh reaktivov i osobo chistykh khimicheskikh
veshchestv i Moskovskogo gosudarstvennogo universiteta M.V.
Lomonosova. Submitted May 1964.

L 4514-66   EWT(1)/EWT(m)/FCC/EWA(h)   GS/GW
ACCESSION NR: AT5022841   UR/0000/65/000/000/0280/0282

AUTHOR: Denikayev, R. Z.; Kolomeyets, Ye. V.; Kozak, L. V.; Mirkin, L. A.; Prilep-
skiy, B. A.; Roshchupkin, V. G.

TITLE: Test operation of the neutron monitor and Mu-meson telescope

SOURCE: Vsesoyuznoye soveshchaniye po kosmofizicheskomu napravleniyu issledovaniy
kosmicheskikh luchey. 1st, Yakutsk, 1962. Kosmicheskiye luchi i problemy kosmofiziki
(Cosmic rays and problems in cosmophysics); trudy soveshchaniya. Novosibirsk, Redizdat
Sib. otd. AN SSSR, 1965, 280-282

TOPIC TAGS: cosmic ray measurement, neutron counter, mu meson, cosmic ray tele-
scope, particle counter, error correction

ABSTRACT: The present authors list 10 changes introduced in the neutron monitor of the
cosmic ray station of the Kazakh State University, which started operation in 1957 en-
countered current leakages, various instabilities, and errors in design. The changes listed
contributed to an improved operation of the monitor during the last four years. A brief
description is given of the design and operation of an azimuthal μ-meson telescope intended
for continuous registration of the directed intensity of hard cosmic ray components. The
device, which was put in operation in 1962, consists of four identical counter sections each

Card 1/2

· 0901 0062

L 4514-66

ACCESSION NR: AT5022841

pair of which registers particles coming from a given zenith angle but from opposite azimuthal directions. "The authors thank senior engineer Yu. Kapitonov for advice and help during the investigation." Orig. art. has: 3 figures.

ASSOCIATION: None

SUBMITTED: 29Oct64   ENCL: 00   SUB CODE: AA, NP

NO REF SOV: 003   OTHER: 000

Card   2/2

KOZAK, L.V.; KOLOMEYETS, Ye.V.; MIRKIN, L.A.; PRILEPSKIY, B.A.;
     ROSHCHUPKIN, V.I.

     Azimuthal μ-meson telescope of the cosmic ray station of Kazakh
     State University. Geomag.i aer. 2 no.6:1148-1150 N-D '62.

                                        (MIRA 16:1)

     1. Kazakhskiy gosudarstvennyy universitet.
             (Alma-Ata—Telescope)   (Cosmic rays)

YES'KOV. G., podpolkovnik, kand. istoricheskikh nauk; PRILEZHI?, D.,
   polkovnik. kand. istoricheskikh nauk

The world socialist system, a decisive revolutionary factor of the
present. Komm. Vooruzh. Sil 5 no.22:34-41 N '64.

(MIRA 17:12)

PRILEPSKIY, D., podpolkovnik, kand.istoricheskikh nauk

So a man may not stumble. Voen. vest, 42 no.7:45-46 Jl '62.

(MIRA 15:8)

(Military discipline)   (Communist Youth League)

PRILEPSKIY, F.V., inzh.; NEYMAN, Ya.M., inzh.

Redesigning a seasonal brick plant for the production of
agloporite. Stroi.mat 8 no.10:6-10 O '62.   (MIRA 15:11)
     (Moscow Province--Aggregates (Building materials))

SEVERIN, V.N., gvardii podpolkovnik med. sluzhby; PRILEPSKIY, G.P., polkovnik
  med. sluzhby

  Treatment of perforated ulcers of the stomach and duodenum in remote
  areas. Voen.-med. zhur no.5:31-34 My '57   (MIRA 12:7)
        (PEPTIC ULCER, perforation,
              ther. in field cond. (Rus))

PRILEPSKIY, K.N.

Use of the twin-entry system in the Stalinugol' Combine mines.
Ugol' Ukr. 5 no.1:12-14 Ja '61.   (MIRA 14:1)

1. Nachan'nik shakhty "Budennovskaya-Vostochnaya" tresta Budenno-
vugol'. Ugol' Ukr. 5 no.1:12-14 Ja '61.   (MIRA 14:1)
        (Donets Basin—Coal mines and mining)

PRILEPSKIY, K.N., gornyy inzh.

Scientific technological Conference on slab entry drifting.
Ugol' Ukr. 2 no.2:47-48 F '58.   (MIRA 13:3)
     (Mining engineering--Congresses)

PRILEPSKIY, K.N.

Work practices in improving labor protection at the Rostov
Coal Mine Combine. Ugol' 31 no.1:32-33 Ja '56. (MLRA 9:4)
    (Donets Basin--Coal miners)

ACC NR, AP6032948   SOURCE CODE: UR/0363/66/002/010/1811/1815

AUTHOR: Yozorskiy, M. L.; Korlova, N. I.; Bagotskiy, V. S.; Kalliga, O. P. (Deceased);
Domonis, I. M.; Rastorguyev, L. N.; Prilopskiy, V. I.

ORG: none

TITLE: Electric conductivity of solid solutions of calcium oxide in zirconium dioxide
at elevated temperatures

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 10, 1966.

TOPIC TAGS: calcium oxide, zirconium compound, electric property, solid solution

ABSTRACT: The electric conductivity χ of ZrO_2-CaO solid solutions was studied at
600-1000 °C as a function of the CaO content and the degree of purity of ZrO_2 and meth-
od of its stabilization. In this range, the temperature dependence of χ was found to
be expressed by the equation $\chi = A_0^{-E/RT}$, where E and A are constants. The curve
of the dependence of χ on the CaO content at 1000 °C passes through a maximum at 12.5
mole % CaO; this maximum is independent of the purity of ZrO_2 (i. e., of the presence
of HfO_2 impurity) and method of its stabilization. As the density of the sintered
ZrO_2-CaO sample rises, its electric conductivity increases. X-ray structural analysis
was used to determine the limits of homogeneity of cubic solid solutions; the presence
of a superstructure was established in samples with CaO ≥ 15 mole %. On the basis of

Card 1/2   UDC: 54-16:537.311

ACC NR: AP0032948

the x-ray data, an attempt is made to explain the dependence of χ on the CaO content of the ZrO_2-CaO solid solutions. Orig. art. has: 4 figures, 2 tables and 1 formula.

SUB CODE: 07/ SUBM DATE: 13Jan66/ ORIG REF: 002/ OTH REF: 008

Card 2/2

L 6989-66   EWT(m)/EWA(c)/EWP(b)/T/EWP(t)   IJP(c)   JD

ACC NR: AP5017333   ·   SOURCE CODE: UR/0181/65/007/007/2235/2237

AUTHOR: Umanskiy, Ya. S.; Prilepskiy, V. I.; Gorelik, S. S.

ORG: none

TITLE: Roentgen characteristic temperature of Ge-Si solid solutions

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 2235-2237

TOPIC TAGS: temperature characteristic, Debye temperature, elastic modulus, germanium compound, silicon compound

ABSTRACT: Roentgen characteristic temperature of Ge-Si solid solutions θ_M, was determined by x-ray methods. This value directly measures $\bar{U}^2$, the mean square displacement of atoms from equilibrium sites. The magnitude of $\bar{U}^2$ depends not only on the boundary frequency but also on the form of the thermal oscillation spectrum of the lattice. Calculated and experimental values of θ_M are compared with those of θ (Debye characteristic temperature) for Ge-Si alloys of equiatomic compositions; the calculated values are obtained from the following formula:

$$\theta = a + bT_m^{1/2}\delta^{-1}M^{-1},$$

where T_m is the melting point of the alloy, δ^3 is the atomic volume, M is the average atomic weight of the alloy, a and b are constants determined from data for pure com-

Card 1/2

L 6989-66

ACC NR: AP5017333

ponents; and

$$\theta = \frac{h}{k}\left(\frac{3qN\rho}{4\pi M}\right)^{1/3} v$$

where N is Avagadro's number, ρ is density, M is molecular weight, q is the number of atoms in a molecule, v is the parameter incorporating the speed of the longitudinal and transverse waves. For the experiment, pure n-Ge and p-Si were alloyed and processed into crystals, whereupon θ_M was calculated from the thermal dependence of the x-ray intensities of the (711), (642) and (553) lines, using MoK$_\alpha$ radiation with a Zr filter and a scintillation counter. Values for θ were obtained by employing calorimetric and elastic modulus methods. The tabulated results for Ge-Si alloys show values ranging from 460 to 475°K for θ and from 371° to 408°K for θ_M. Orig. art. has: 1 table.

SUB CODE: SS/   SUBM DATE: 15Feb65/   ORIG REF: 002/   OTH REF: 008

Card 2/2

L 8852-66   EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(h)/EWA(c)   IJP(c)   JD/LHE/AT

ACC NR: AP5022703   SOURCE CODE: UR/0181/65/007/009/2673/2677

AUTHOR: Umanskiy, Ya. S.; Prilepskiy, V. I.; Gorelik, S. S.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Measuring diffuse scattering of x-rays to study order in an equiatomic solid solution of germanium and silicon

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2673-2677

TOPIC TAGS: solid solution, semiconductor research, x ray scattering, ordered alloy, silicon alloy, germanium alloy

ABSTRACT: Diffuse scattering of x-rays was used for studying short-range order in an equiatomic semiconducting germanium-silicon solid solution. The experimental equipment and procedure are described. The measurements were made at room temperature at angles from 6 to 21°. Coefficients α_i associated with the localized ordering of the atoms, and the dimensional coefficients β_i determined by the difference in sizes of the component atoms were calculated for three coordination spheres by the method of least squares. The results are tabulated. The values of α_i were used for plotting a curve for the intensity of diffuse scattering by the equiatomic Ge-Si al-

Card 1/2

L 8852-66

ACC NR: AP5022703

loy. The formulas used for calculating the intensities are given. A curve is also shown for radial distribution of atomic density. Orig. art. has: 3 figures, 8 formulas.

SUB CODE: 20/   SUBM DATE: 19Mar65/   ORIG REF: 007/   OTH REF: 005

BVK
Card 2/2

PRILEPSKIY, V.I.; MERSHCHIY, N.P.; ALFEROV, K.J.

Production of semikilled steel for periodic reinforcement
of large diameter. Stal' 25 no.3:217-220 Mr '65.
(MIRA 18:8)

L 26623-66   EWT(m)/EWP(t)   IJP(c)   JD

ACC NR: AP5025372   SOURCE CODE: UR/0181/65/007/010/2958/2961   31
                                                                                 E

AUTHOR: Umanskiy, Ya. S.; Prilepskiy, V. I.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Elastic oscillation spectra and characteristic temperatures of germanium and silicon

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 2958-2961

TOPIC TAGS: germanium, silicon, elastic oscillation

ABSTRACT: X-ray characteristic temperatures (θ_m) of germanium and silicon from elastic oscillation spectrum were computed. Values of x-ray characteristic temperatures obtained from the spectra coincide well with the experimental values of the authors. Calculations as to actual spectra indicate that mean ranges of the spectrum contribute the most to the summation during temperatures approaching absolute zero. This is also confirmed by the disagreement of θ_m with the value of θ determined by the elastic modulus method. The elastic moduli method provides values of θ which depend only on the initial long wave portion of the spectrum. This also explains the good agreement of elastic and heat capacity

Card 1/2

L 26623-66

ACC NR: AP5025372

values of θ measured at low temperatures. Orig. art. has: 3 fig. and 1 table.

SUB CODE: 20, 11/ SUBM DATE: 15Apr65/ ORIG REF: 003/ OTH REF: 014

Card 2/2

PRILEPSKIY, V.I.; MERSHCHIY, N.P.; ALFEROV, K.S.

Some characteristics of the technology of making steel with natural
gas heating of open-hearth furnaces. Stal' 25 no.7:606-610 Jl '65.
                                                        (MIRA 18:7)

ALFEROV, K.S.; PRILEPSKIY, V.I.; MERSHCHIY, N.P.

New developments in research. Stal' 23 no.9:851 S '63.
(MIRA 16:10)

PRILEPSKIY, V.I.; ELIMELAKH, R.Z.

New developments in research. Stal' 23 no.9:804 S '63.
(MIRA 16:10)

ALFEROV, K.S.; MERSHCHIY, N.P.; PRILEPSKIY, V.I.

Production of semikilled St.5ps reinforcement steel at the Makeevka
Metallurgical Plant. Stal' 23 no.7:615-618 Jl '63.(MIRA 16:9)
(Makeevka—Iron and steel plants)
(Concrete reinforcements)

MAL'KOV, V.G., inzh.; PRILEPSKIY, V.I., inzh.; DUBROV, V.S., inzh. V rabote
     prinimali uschastiye: KHIL'KO, M.M., inzh.; MERSHCHIY, N.P., inzh.;
CHETVERIKOV, V.Ya., inzh.; KUROV,I.N., inzh.; RATNER, B.R., inzh.;
BULYCHEV, G.D., inzh.; ALFEROV, K.S., inzh.; PAVLENKO, N.M., inzh.;
FINKEL'SHTEYN, M.M., inzh.; PLUZHKO, N.F., inzh.; SAMSONOV, T.F.,
inzh.; BABENKO, N.N., inzh.; LAD'YANOV, N.I., inzh.; TUPIL'KO, V.S.,
inzh.

Deoxidizing and alloying 25G2C steel with ferromanganese and ferro-
silicon in 200-ton ladles. Stal' 20 no.9:803-806 S '60.(MIRA 13:9)
                    (Steel, Structural—Metallurgy)

0

PRILEPSKII, V I

PRILEPSKIY V.I.   133-9-6/23

AUTHOR: Bornatskiy, I.I. Candidate of Technical Sciences and
           Zubkov, A.P., Prilepskiy, V.I., Engineers.

TITLE: Increasing the Capacity of Stock Yard and Mould Preparation
           Shop. (Povysheniye propusknoy sposobnosti shikhtovogo dvora
           i uchastka podgotovki sostavov izlozhnits)

PERIODICAL: Stal', 1957, No.9, pp. 796 - 800 (USSR).

ABSTRACT: The introduction of chrome-magnesite roofs, evaporation
           cooling and the use of oxygen increased the output of the melting
           shop so that the capacity of the stock yard and mould preparation
           shop became a bottleneck in the further increase in the production
           of steel. In the paper, the experience gained in increasing the
           throughput capacities of the above auxiliary services is dis-
           cussed. The following participated in the work: V.O. Kulikov,
           S.V. Vasil'yev, M.M. Khil'ko, V.S. Kaprov, K.S. Al ferov, D.P.
           Zhidetskiy, V.Ya. Chetverikov, A.YE.Biryukov, L.L. Gobach and
           others. There are 3 figures.

ASSOCIATION: Makeyevka   Metallurgical Works im.Kirov (Makeyevskiy
              Metallurgicheskiy Zavod im. Kirova)

AVAILABLE: Library of Congress.
Card 1/1

UMANSKIY, Y...; FRUTETSKIY, V.I.; CORVLIK, ...

Studying the order in an equiatomic germanium-silicon solid solution
by measuring the diffuse scattering of X rays. Fiz. tver. tela 7
no.9:2673-2677 S '65.   (MIRA 18:10)

1. Moskovskiy institut stali i splavov.

OHRANSKIY, Yu... ...

...otic vibration spectra and characteristic temperatures of
...enium and silicon. Fiz. tver. tela 7 no.10:2958-2961. O '65.
(MIRA 18:11)

1. Moskovskiy institut stali i splavov.

KULIKOV, V.O., inzh.; KHIL'KO, M.M., inzh.; PRILEPSKIY, V.M., inzh.;
ZUBKOV, A.P., inzh.; prinimali uchstiye; MERSHCHIY, N.P.,
inzh.; CHETVERIKOV, V.Ya., inzh.; DUBROV, V.S., inzh.; VOLKOV,
I.F., tekhnik; YERSHOV, V.I.; tekhnik; SAFONOVA, M.F., tekhnik

Using scale in steelmaking by the scrap and ore process.
Stal' 20 no.8:708-710 Ag '60. (MIRA 13:7)
(Open-hearth process)

PRILEYA EVA,I.N., DOMBOVSKAYA,T.N.,SPIVAK,G.V.,KABANIUK,N.J.,SAITANINA,I.S.
AZOVTSEV,V.X.

                "On the Direct Visualization of the Domains of a Ferromagnetic
by means of an Electron Microscope with Secondary Emission and an Electron
Mirror"   Moscow

Conference on Physics of Magnetic Phenomena,
May 1956, Sverdlovsk, USSR

1. SPIVAK, G. V., PRILEZHAYEM, I. N., SAVOCHKINA, O. I.

2. USSR (600)

4. Metals - Pickling

7. Nature of etching metals by means of ion bombardment. Dokl AN SSSR No 3   1953

9. Monthly List of Russian Accessions, Library of Congress, _____April_____1953, Uncl.

PRILEZHAYEV, A.I.

CA

5

Preparation of a bromide emulsion for paper. A. I.
Prilezhaev. *Trans. Optical Inst.* (Leningrad) 9, No. 84
(1933); cf. C. A. 27, 92).—The emulsion formula given
differs from those already published in that a plain soln.
of AgNO₃ and afterward an ammoniacal soln. is added
to the gelatin contg. KBr and citric acid. It is claimed
that very large quantities of emulsion have been made by
this formula and have proved satisfactory. C. E. K. M.

METALLURGICAL LITERATURE CLASSIFICATION

L 44076-66   EWT(l)/EEC(k)-2/T/EWP(k)   IJP(c)   WG

ACC NR: AP6030713   SOURCE CODE: UR/0368/66/005/002/0167/0171

AUTHOR: Antoshina, Ye. N.; Kozlov, N. A.; Mak, A. A.; Stepanov, A. I.; Prilezhayev, D. S.

ORG: none

TITLE: Efficiency of reflectors for solid-state lasers

SOURCE: Zhurnal prikladnoy spektroskopii, v. 5, no. 2, 1966, 167-171

TOPIC TAGS: solid state laser, laser reflector, pumping source, xenon lamp

ABSTRACT: Methods of determining the efficiency of solid-state laser reflectors were considered. The efficiency of elliptic- and circular-cylinder reflectors and the distribution of pumping energy in cylindrical neodymium-glass rods were determined experimentally. Elliptic-cylinder reflectors were prepared from metal with a surface coefficient of reflection $R = 0.8-0.9$. The flashlamp and the glass rod were placed along the major axis. Circular-cylinder reflectors were made of glass tubes whose outer surface was silver-coated ($R \sim 0.9$). The reflector end-caps were made of metal ($R \sim 0.8-0.9$). The flashlamp and specimen were parallel to the cylinder axis and were equidistant from the center. The standard reflector used in the comparative experiments consisted of four spherical mirrors with $R \sim 0.8$. The efficiency of the elliptic- and circular-cylinder reflectors was determined from the comparison of the generation energy of power therein with that of the standard reflector. The experi-

Card   1/3   UDC: 621.378.325

L 44076-66

ACC NR: AP6030713

mental results, shown in Table 1, indicate that there exists an optimal reflector
diameter for which the efficiency is a maximum. The pump light distribution in two

Table 1. Efficiency of laser reflectors

Type of Reflector	Major axis	Di-ame-ter	Distance between lamp and rod axes mm	Dimensions of flashlamp and rod		Efficiency	
				dia. mm	length mm	experi-mental	calcu-lated
Standard	—	—	9	5	45	—	0.25
Elliptic cylinder	100	—	40	5	45	0.36	0.35
	100	—	40	8	80	—	0.49
Circular cylinder	—	19	9	8	80	-	0.61
	—	20	9	8	80	0.58	0.64
	—	30	9	8	80	0.75	0.67
	—	44	9	8	80	0.67	0.72
	—	60	9	8	80	-	0.6
	—	70	9	8	80	0.66	-
	—	77	9	8	80	0.64	0.56

laser rods (one 5 mm in diameter in an elliptic cylinder reflector and one
8 mm in a 40-mm-diameter circular cylinder reflector

Card 2/3

L 44076-66

ACC NR: AP6030713

with results obtained elsewhere (Yu. A. Anan'yev and Ye. A. Korolev, O & S, 16, 702, 1964). All data were found to be in agreement. The efficiency of circular-cylinder reflectors with optimal parameters may be as high as 75%. Orig. art. has: 1 table and 4 figures.

[YK]

SUB CODE: 20/ SUBM DATE 09Nov65/ ORIG REF: 005/ OTH REF: 011/ ATD PRESS: 5075

Card3/3

L 7691-66   EWA(k)/FBD/EWT(1)/EWT(m)/EPF(c)/EEC(k)-2/T/EWP(t)/EWP(k)/EWP(b)/
EWA(m)-2/EWA(h)   SCTB/IJP(c)   WG/JD/JW

ACC NR: AP5028019

SOURCE CODE: UR/0386/65/002/008/0380/0383

AUTHOR: Yermakov, B. A.; Lukin, A. V.; Mak, A. A.; Prilezhayev, D. S.

ORG: none

TITLE: Monopulse generation with $CaF_2:U^{3+}$ crystals

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 8, 1965, 380-383

TOPIC TAGS: solid state laser, laser pulsations, laser

ABSTRACT: This is a continuation of earlier work (Optika i spektroskopiya v. 18, 353, 1965) in which attainment of monopulse generation in the 2.36μ infrared region with $CaF_2:Dy^{2+}$ was reported. In the present paper the authors report attainment of monopulse generation with $CaF_2:U^{3+}$ crystals at wavelengths 2.22 and 2.51 μ, using an experimental setup in which the crystals are cooled to 80—90K by a jet of nitrogen gas evaporated from the liquid phase (Fig. 1). A semitransparent coating with reflection coefficient $R = 0.95 \pm 0.6$ was deposited on one end of the crystal. The cavity switching was by means of a rotating total internal-reflection prism. The pump-lamp ignition was synchronized with a photoelectric system coupled to the prism rotating at 1—2 x 10^4 rpm. The crystals used were 3—55 mm in diameter and 20—30 mm long. The radiation receiver was a Ge:Au photoresistance, and the generated energy was measured with a bolometer. The monopulse lasing at $\lambda_3 = 2.22$ μ was of the three-level type (Fig. 2a), with emission energy 0.1×10^{-3} J, corresponding to a pulse power of
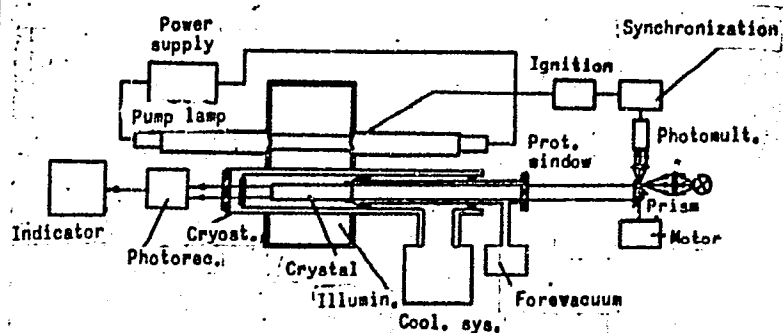
Card 1/3

L 7691-66

ACC NR: AP5028019

O

Power supply

Pump lamp

Ignition

Synchronization

Photomult.

Prot. window

Prism

Indicator

Cryost.

Photorec.

Crystal

Illumin.

Cool. sys.

Forevacuum

Motor

Fig. 1. Experimental setup

~4 x 10^3 W. In several crystals monopulse 4-level generation (λ_4 = 2.51 µ) was obtained, apparently, because of the high concentration of the activator in these crystals. The shape of the pulse was the same as in Fig. 2a. The maximum laser energy in the monopulse was 10^{-3} J in this case (pulse power ~5 x 10^4 W). At smaller prism

Card 2/3

L 7691-66

ACC NR: AP5028019
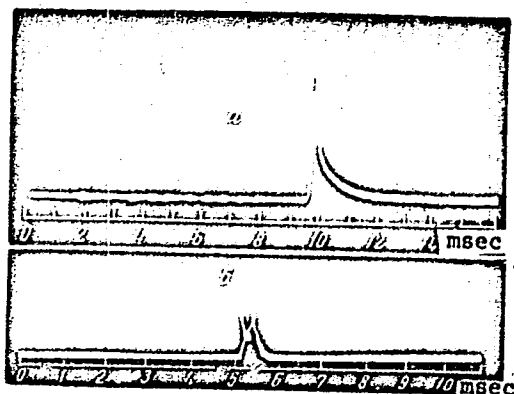
Fig. 2. Monopulse oscillograms

speeds, several laser pulses were obtained rather than one (Fig. 2b). Orig. art.
has: 2 figures.

[02]

SUB CODE: EC/ SUBM DATE: 31Aug65/ ORIG REF: 002/ ATD PRESS: 4/4/

Card 3/3

ANAN'YEV, Yu.A.; YEGOROVA, V.F.; MAK, A.A.; PRILEZHAYEV, D.S.;
SEDOV, B.M.

Operation of a four-level optical maser. Zhur. eksp. i teor.
fiz. 44 no.6:1884-1888 Je '63.   (MIRA 16:6)

1. Gosudarstvennyy opticheskiy institut im. S.I. Vavilova.
                          (Lasers)

L 10728-63   EWA(k)/EWT(1)/FBD/T-2/3W2/EEC(b)-2/ES(t)-2/BDS   AFFTC/ASD/
ESD-3/RADC/APGC/AFWL   Pl-4/Po-4   JHB/WG/IJP(C)/K/EH

ACCESSION NR: AP3003116   S/0056/63/044/006/1884/1888

AUTHOR: Anan'yev, Yu. A.; Yegorova, V. F.; Mak, A. A.; Prilezhayev, D. S.;
Sedov, B. M.

TITLE: On the operation of a four-level laser

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 1884-1888

TOPIC TAGS: four-level laser, trivalent uranium laser, divalent samarium
laser, calcium fluoride laser

ABSTRACT: A theoretical and experimental study of the operation of a four-level
laser has been conducted. Equations were derived for steady-state operation,
cavity parameters, properties of working substances and host substances,
pumping power, threshhold, energy-level populations, various transition proba-
bilities, and output power. To verify the theoretical calculations, experiments
were conducted to determine the dependence of pumping power and output power

Card 1/2

L 10728-63

ACCESSION NR: AP3003116

of samarium-doped and uranium-doped calcium fluoride lasers on crystal tem-
perature and reflection factor of the mirrors and to determine the relationship
between pumping power and output power. Cylindrical crystals with dielectric-
coated end faces were used with temperatures ranging from 8 to 300K. Experi-
mental results were in good agreement with the theoretical. Conditions for the
transition from four-level to three-level operation were found for the uranium-
doped calcium fluoride laser. Orig. art. has: 10 formulas and 4 figures.

ASSOCIATION: Gosudarstvenny*y opticheskiy institut im. S. I. Vavilova
(State Institute of Optics)

SUBMITTED: 21Feb63   DATE ACQ: 23Jul63   ENCL: 00

SUB CODE: 00   NO REF SOV: 001   OTHER: 002

Card 2/2

L 29216-66

ACC NR: AP6015433   SOURCE CODE: UR/0051/66/020/005/0890/0897

AUTHOR: Yegorova, V. F.; Zubkova, V. S.; Mak, A. A.; Prilezhayev, D. S.   A9
                                                                           B

ORG: none

TITLE: Luminescence and stimulated emission spectrum of CaF$_2$-U^{3+} crystals

SOURCE: Optika i spektroskopiya, v. 20, no. 5, 1966, 890-897

TOPIC TAGS: absorption spectrum, excitation spectrum, luminescence spectrum, crystal phosphor, fluorite, color center, uranium

ABSTRACT: Data are given from a detailed analysis of the absorption, luminescence, and stimulated emission spectra of fluorite crystals activated by trivalent uranium ions at 4.2-300°K. A vacuum monochromator with a resolution of 1.5-3 Å at λ=2.5 μ was used for taking the absorption and luminescence spectra. An incandescent lamp with a tungsten filament was used for exciting luminescence in the crystal. An FEU-22 photomultiplier and a cooled lead sulfide resistor were used as detectors. The recording system was made up of an amplifier, asynchronous detector, and a PS1-02 electronic potentiometer. It was found that the absorption spectra of these crystals is due to at least four types of color centers. The specimens were divided into two classes, the first being lilac in color and the second—red. Each type has its distinct characteristics in absorption, luminescence, and excitation spectra. Crystals containing both

                                                      UDC: 621.375.9 : 535

Card 1/3

L 29216-66

ACC NR: AP6015433 O

types of centers (mixed type) show more complex spectra. The difference between crys-
tals of the first and second type is most pronounced in the absorption and lumines-
cence spectra in the near infrared region. The spectrum for crystals of the first
type is rather simple in the 2.1—2.6 μ region. Absorption resonance lines are ob-
served at 2.15 and 2.223 μ and an additional line is observed in the luminescence
spectrum at 2.43 μ which disappears at helium temperatures as well as a line at 2.512
μ which is observed at low temperatures. Luminescence excitation in crystals of the
first type is due chiefly to absorption in the 0.4—0.6 μ region of the spectrum. The
spectrum for crystals of the second type is more complex with six resonance lines at
2.15, 2.252, 2.246, 2.237, 2.228, and 2.221 μ which may be due to transitions between
the ground level and splitting components of the $^4I_{11/2}$ state. Luminescence excita-
tion for crystals of the second type takes place chiefly in the 0.7—1.2 μ spectral re-
gion due to wide absorption bands. Experimental data were used for constructing the
diagrams of lower levels for crystals of both types. Considerable interaction is ob-
served between centers of the first and second type in mixed crystals. Crystals of
the first type show stimulated emission in three spectral bands: 2.512 μ, 2.435 μ,
and 2.223 μ. The positions of the emission peak with respect to time for the 2.512
and 2.223 μ bands show a considerable degree of correlation: the emission maximum in
one band corresponds to the minimum in the other. This indicates that these bands
have a common initial upper level. Stimulated emission is observed in crystals of the
second type in the 2.518 and 2.61 μ bands. Stimulated emission in crystals of this
type is due basically to absorption bands at 0.8 and 0.9 μ. Mixed crystals show simul-

Card 2/3

L 29216-66

ACC NR: AP6015433

taneous emission in the 2.512, 2.518 and 2.518 μ bands. The interaction between cen-
ters of the first and second type in these crystals is discussed. Orig. art. has:
7 figures.

[14]

SUB CODE: 20/   SUBM DATE: 22Jun64/   ORIG REF: 005/   OTH REF: 003/

ATD PRESS: 5104

Card 3/3 LC

YERMAKOV, B.A.; LUKIN, A.V.; MAK, A.A.; PRIIEZHAYEV, ...

Monopulse generation on $CaF_2:U^{3+}$ crystals. Pis'. v red. Zhur. eksper. i teoret. fiz. 2 no.8:380-383 O '65.   (MIRA 18:12)

1. Submitted August 31, 1965.

PRILEZHAYEV, S.S.

Category : USSR/General Problems - Problems of Teaching   A-3

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 2781

Author   : Prilezhayev, S.S.
Title   : Experience in Teaching a Physics Course

Orig Pub : Tr. Leningr. san-gigiyen.med. in-ta, 1956, 36, 167-174

Abstract : No abstract

Card   : 1/1

PRILEZHAYEV, S. S.

The antimony cesium photocathode. S. S. Prilezhaev.
J. Tech. Phys. (U.S.S.R.) 9, 1839-54(1939).—The cell
contg. an Sb-Cs cathode was connected with a side tube
contg. Cs. The side tube was kept at a temp. h_1 to
maintain a definite vapor pressure of Cs in the cell;
and the cathode was heated to a temp. h_2 to change the
amt. of Cs adsorbed. The "adsorption equilibrium"
was reached in a few hrs. The equil. value of the total
photosensitivity at a const. h_1 rose with increasing h_2 to
a max. and then fell; when h_1 increased from 20 to 180°
the temp. of the max. was shifted from 140 to 200°.
When the sensitivity i increased, the work function φ
diminished according to an equation $\log i = B_1 - B_2\varphi$
(B_1 and B_2 being const.); in the max. of sensitivity φ
was 1.30 e. v. The spectral sensitivity always had a max.
at 4300 A. and a trace of a relative max. at 6300 A. The
surface of Cs-Sb cathodes has a high elec. resistance which
is lowered by an increase of temp. This and the gradual
increase of the thermionic emission with increasing po-
tential show that Sb-Cs cathodes are nonmetallic.
                                              I. I. Bikerman

3

A S M S L A   METALLURGICAL LITERATURE CLASSIFICATION

GUR'YANOVA, Ye.N.; GOL'DSHTEYN, I.P.; PRILEZHAYEV, Ye.N.; TSYMBAL, L.V.

Structure of some α, β -unsaturated sulfur compounds based on data provided by dipole moments. Izv. AN SSSR. Otd.khim.nauk no.5:810-812 My '62.   (MIRA 15:6)

1. Fiziko-khimicheskiy institut im. L. Ya. Karpova i Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
          (Sulfur organic compounds—Dipole moments)

PRILEZHAYEVA, I. N.

USSR/Electricity - Cathode Sputtering   Jul/Aug 51

"Electron Microscopic Study of Cathodic Diffusion
Process," G. V. Spivak, I. N. Prilezhayeva, E. A.
Gruz, Phys Faculty, Moscow State U imeni M. V.
Lomonosov

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 4, pp 409-411

Studied submicroscopic structure of aluminum sur-
face submitted to cathodic diffusion under low air
or neon pressure. Presence of submicroscopic cones,
formed as results of destructive action of elec
treatment on weaker structural points, was found on
aluminum surface.

195T36

PA 195T36

cA

Electron microscopic investigation of structural modifications of aluminum by electrical erosion. K. A. Michurina, I. N. Prilezhaeva, and G. V. Spivak (M. V. Lomonosov State Univ., Moscow). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 15, 418-23(1951).—Tech. Al annealed at 500° for 5 hrs. to a grain size of 2-3 sq. mm. was etched with a 1:1 mixt. of HCl and MeOH, placed in petroleum, and made anode for a single spark discharge of a 100-microfarad, 110-v. capacitance. An oxide replica of the 1-mm. hole was examd. with an electron microscope. The cubic structure at the periphery of the hole appeared distorted. The central part appeared covered with a metallic foam formed from molten and evaporating metal. Petroleum can be replaced by distd. H₂O to avoid the formation of stable chem. compds. in the erosion hole. The formation of small structure leads to considerable surface hardening.   S. Pakswer

PRILEZHAYEVA, I-N.

"The nature of cathodic sputtering of metals. G. V. Spivak, I. N. Prilezhaeva, and O. T. Savochkina. Zhur. Tekh. Fiz. 23 (1953).—Probe expts. indicated development of etch pits by ionic bombardment

PRILEZHAYEVA, I.N.

Metallurgical Absu.
Vol. 21 May 1954
Structure

Physics Faculty, Moscow State U.

*Nature of Etching of Metals (Aluminium) in Ionic Bombardment. G. V. Spivak, I. N. Prilezhaeva, and D. I. Sarychkina (Doklady Akad. Nauk S.S.S.R., 1953, 88, (3), 511-514).—[In Russian]. An electron-microscope investigation was made of the changes in structure on sputtering Al, as the "third electrode" in a 3-electrode tube, under various conditions of current (I), voltage relative to the anode (V), gas pressure (p), and sputtering time (t). Specimens of Al previously recrystallized at 500° C. for 5-6 hr. and electro-polished, were sealed into the tube, which was then warmed and flushed out several times with gas. Usually experiments were made in A, but some were made in No. I/V curves for a spherical electrode were first obtained; they were initially linear (corresponding to a purely ionic current, with ions accelerating in the layer surrounding the electrode, but not originating in that layer), but I then increased more rapidly. Specimens were then sputtered for fixed times at conditions corresponding to selected points on the curves, and oxide replicas of the sputtered surfaces were prepared. The distribution of the region of sputtering depended essentially on I. Three stages could be distinguished in the process. (i) Removal of any remaining impurities. This was transitory, with no change in structure if I = 100 μamp. and t = 10-15 min. (ii) The ionic etching stage, producing cubic structures similar to those obtained in chem. etching. At low V, changes in I were more effective than changes in V; thus, with t = 1 hr., while there was almost no trace of sputtering at c.d. = 140 μamp./cm.², well-defined cubes were obtained at 170 μamp./cm.², but increasing V from 700 to 1400 V. at c.d. of 100-140 μamp./cm.² had little effect. In addn. to cubes, some conical shapes were also present

(over)

4

(cf. S., C. and Guaz, Izvest, Akad. Nauk S.S.S.R., 1951,
[Fiz.], 16, 60, 30.] and Wood, of ap to 600 800 photographs
and T. (17.5keV) there very comes but necessary. Metals
are not responsible for the cones, since these form only
on easily molten metals. Sputtering on cube planes is
attributed to the formation of metal spot on the surface,
owing to the presence of impurities on the metal. The
result of experiments and is not connected to the fea-
...

37

PRILEZHAYEVA, L.N

4415* Etching Steel by Ionic Bombardment. O travlenii
stalei ionnoi bombardirovkoi. (Russian.) L. N. Prilezhaeva,
G. V. Spivak, and M. I. Maltina. Zhurnal Tekhnicheskoi Fiziki,
v. 24, no. 11, Nov. 1954, p. 2090-2096.
Applicability of ionic etching to various types of steel. Effects
of varying the voltage, current density, etc. Micrographs.

PRILEZHAYEVA, I. N

Electron-optical investigations of nonstationary emissions of an oxide cathode in vacuum and in gases. I. N. Prilezhaeva, V. V. Livshits, and G. V. Spivak. *Zhur. Tekh. Fiz.* 25, 97–107 (1955).—The expt. results are presented in the form of curves and photographs for all the changes in the cathode emissions due to various setups of the electron-optical objective, such as changes of the distance cathode-first (focussing) diaphragm, distance between the first and the second (anode) diaphragm, the diam. of the apertures in the diaphragms, the distance cathode-screen, the potential ratio first/second diaphragm. Such changes are shown for the elec. field near the cathode and for the focusing potential, and the images are compared for 2 and 3 diaphragms. The electron-optical systems were investigated in the same manner, if impulses of 30 to 50 microsec. were used, and the pictures are shown for 5000-v. impulses after 1, 2, and repeated sparks, and the changes of all these factors are studied for highest possible vacuum, and the presence of A in pressures from 5×10^{-4} to 1 mm. Hg, by keeping the impulses const. to 25 microsec. The admission of gas causes a de-focusing; also the images acquire a background.

Werner Jacobson

SPIVAK, G.V., PRILEZHAYEVA, I.N., AZOVTSEV, V.K.

Magnetic contrast in the electron mirror and observations on
ferromagnetic domains. Dokl. AN SSSR 105 no.5:965-967 D '55.
(MLRA 9:3)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
Predstavleno akademikom M.A. Leontovichem.
                (Ferromagnetism) (Electron optics)

PRILEYAYEVA, I. N., SHITNIKOVA, I. S., KANAVINA, N. G. SPIVAK, C. V., POIBOVSKAYA, T. N. and AZOVTSEV, V. K. (Moscow)

"On the Direct Visualization of the Domains of a Ferromagnetic by Means of an Electron Microscope with Secondary Emission and an Electron Mirror," paper presented at the International Conference on Physics of Magnetic Phenomenon, Sverdlovsk, USSR, 23-31 May 1956

Ph, Tzzhulaven I. M.

Processes on the metal surface during cathode sputtering.
G. V. Spivak, V. E. Yurasova, I. N. Prilezhaeva, and I. E. Pravdina. Bull. Acad. Sci. U.S.S.R., Phys. Ser. 20, 1075-81(1956)(English translation).—See C.A. 51, 14005. B. M. R.

SPIVAK, G.V.; YURASOVA, V.Ye.; PRILEZHAYEVA, I.N.; PRAVDINA, Ye.K.

Processes on metal surfaces in cathode sputtering. Izv.AN SSSR.Ser.fiz.
20 no.10:1184-1189 O '56.   (MLRA 10:1)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta ime-
ni M.V.Lomonosova.
             (Electron tubes) (Thermionic emission)

12 -2-29/37

AUTHOR: Spivak, G. V., Yurasova, V. Ye., Kushnir, ?. ?.
           Prilezhayeva, I. N.

TITLE: Installation for metal etching by means of Ion Bombardment
           (Ustanovka dlya Travleniya Metallov Ionnoy Bombard-
           irovkoy (UIT-1)).

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No. 2,
           pp. 106 - 110 (USSR).

ABSTRACT: Cathode sputtering has lately been widely applied to
           structure investigation of metals, alloys and dielectrics
           (Ref. 1). Its advantages compared with chemical plating
           have been discussed in Reference 2. Technical details of
           such installations have been described in References 3
           and 4. In the present article the authors give the
           description of the UIT-1 (УИТ-1) installation, thought to
           be much more efficient than the existing ones, mainly
           because of the availability of necessary conditions for
           plating at high temperatures. Similarly to the installation
           described in Reference 3, the UIT-1 (УИТ-1) permits
           accelerated sputtering of a particular sample under forced
           regimes at high potentials and, similarly to that described
           in Reference 4, permits evaporation in a gaseous stream.
           Compared with other types, UIT-1 (УИТ-1) has the following
           advantages. It permits simultaneous sputtering of three

Card 1/3

120-2-29/37

Installation for Metal Etching by Means of Ion Bombardment.

samples (as compared with one in the installation described in References 3 and 4); this enables rapid evaluation of the best conditions for ion plating. A special arrangement for inserting the heated sample is provided, enabling the temperature to be monitored. The temperature may be varied between 100 and 700°C. It is also possible to plate already plated samples with deposits of quartz or metal without introducing air under the bell-jar thus preventing oxidisation of samples. The general view of the installation is given in Figure 1. It consists of a vacuum system (Fig. 2) and power supplies (Fig. 3). The apparatus for simultaneous plating of three samples is shown in Figure 4. Their shape may be arbitrary, with the maximum dimension of the surface to be plated of 20 x 20mm. For accelerated etching at temperatures near room temperature a special insert is provided at the apex of the glass bell-jar (Fig. 6). It is stressed that UIT-1 (УИТ-1) assures good control of the etching and plating processes and a swift change from one operation to another, e.g. the deposition of quartz or metal films on to a sample may begin one minute after the finish of sputtering;

Card 2/3   changing of sputtered samples takes no more than 15 minutes.

12 -2-29/37

Installation for Metal Etching by Means of Ion Bombardment.

The analysis of the ion bombardment etching and of the applicability of the cathode sputterer to the analysis of the grain boundaries and of the surface relief structures of metals and alloys have been discussed in Reference 2. The following have co-operated with the authors in the design of the device: I.P. Bulanova, A.I. Elenova, A.I. Krokhina, N.A. Pereverzev, V.V. Potekhin and T.F. Filippova. Four photographs and three schematic diagrams are given. There are 5 references, 3 of which are Slavic.

SUBMITTED: December, 25, 1956.

ASSOCIATION: Faculty of Physics of the Moscow State University imeni M. V. Lomonosov. (Fizicheskiy Fakul'tet MGU im M. V. Lomonosova.)

AVAILABLE: Library of Congress.

Card 3/3

AUTHORS: Spivak, G. V., Kanavina, N. G., Sbitnikova, I. S.   48-8-21/25
                  Prilezhayeva, I. N., Dombrovskaya, T. N., Azovtsev, V. K.,

TITLE: The Direct Observation of Domas of Ferromagnetica on the Occasion
                  of the Application of the Double-Emission Electron Microscope and
                  the Electron Mirror (O neposredstvennom nablyudenii domenov fer-
                  romagnetika pri pomoshchi vtorichno-emissionnogo elektronnogo
                  mikroskopa i elektronnogo zerkala)

ABSTRACT: Already in 1947 L. Germer proved that the electron beam gliding
                  along the cobalt monocrystal enters into cooperation with doma
                  fields, but the was not able to obtain a doma image because the
                  electron beam used by him for this purpose was not suitable.Also
                  the results obtained by the research work carried out by Marston
                  and his collaborators are here described as interesting, but also
                  in this case doma images were not obtained. In contrast to the
                  works mentioned, a method is suggested here, according to which
                  it is possible to obtain doma images of ferromagnetica by the
                  application of the electron beam, and also the process of magnet-
                  ization can be observed on the surface of the sample. This paper
                  is based upon the idea that it is possible to produce an electron
Card 1/3   optical contrast, and that, hereby, it is possible to study magn-

The Direct Observation of Domas of Ferromagnetica on the Occasion 48-8-21/25
of the Application of the Double-Emission Electron Microscope and the Electron
Mirror.

etic non-uniformity with success. The interaction of a uniform
electron current with a gliding surface containing the magnetic
electric lens causes modulation according to the density of the
electron beam. By the further application of an electrostatic or
magnetic lens (macrolens) the image of the gliding surface or a
nearby surface is obtained, where the effect produced by the lo-
cal magnetic field is the most effective.
The paper is divided in the further course into 5 chapters en-
titled: The Co-operation between micro- and macrolenses; proper-
ties of the electron beam which are of essential importance for
observing the micro-relief; the visualization of domas by means
of double electron emission: visualization of domas by means of
electron mirrors; visualization of magnetic microstructure by the
modulation method. In conclusion it is said that the here recom-
mended methods are of abstract character and permit an indirect
treatment of theproblems in question, so that it is to be re-
commended that research work be carried out according to the di-
rect electro-optical methods in order that more exact knowledge
be obtained in this field. There are 6 figures and 9 references,
6 of which are Slavic.

Card 2/3

The Direct Observation of Domas of Ferromagnetica on the Occasion   48-8-21/25
of the Application of the Double-Emission Electron Microscope and the Electron
Mirror.

ASSOCIATION: Dept. of Physics ,of Moscow State University imeni M.V.Lomonosov
             (Fizicheskiy fakul'tet Moskovskogo gos. universiteta imeni M.V.
             Lomonosova)

AVAILABLE: Library of Congress

Card 3/3

VONSAROVSKIY, N.; PRILEZHAYEVA, N.

Control over stocks of equipment and materials. Len. i kred.
19 no.11:61-64 N '61. (MIRA 14:12)

1. Nachal'nik otdela kreditovaniya promyshlennosti sovnarkhoza
Odesskoy oblastnoy kontory Gosbanka (for Vonsarovskiy). 2.
Starshiy kreditnyy inspektor Odesskoy oblastnoy kontory Gosbanka
(for Prilezhayeva).
            (Odessa Province--Industrial procurement)
            (Odessa Province--Banks and banking)

VONSAROVSKIY, N.; IRILE.HAYEVA, N.

State Bank control over the reduction of above-norm inventories.
Den. i kr.d. 18 no.12:41-43 D '60.   (MIRA 13:11)
    (Odessa--Banks and banking) (Odessa--Industrial management)

PROCESSES AND PROPERTIES

The detection of iodine atoms in the optical dissociation of the vapors of iodine salts N. PRILEZHAYEVA. *Physik Z. Sowjetunion* 1, 180 202(1932) Ultra-violet irradiation of electrically excited vapors of I compds. causes a marked increase in the intensity of the line 2062.2 A. U. of the I atom. In the case of HgI_2 the band systems at $\lambda 2111$ 2100 and 2168 2240 also increase in intensity. A consideration of thermo-chemical and spectroscopic data permits these bands to be ascribed to the HgI mol with a vibration quantum of 125 cm^{-1}. The strengthening of these bands and of the line 2062.2 is brought about by the same wave length of exciting light that also excites the fluorescence of HgI_2 vapor, this process having been formerly shown to be due to the photodissocn $HgI_2 + h\nu = HgI' + I$. The observed strengthening can therefore be considered a revealing in the elec discharge of the products of the photodissocn The splitting off of I atoms by the optical dissocn of NaI and I_2 according to the reaction $NaI + h\nu = Na' + I$ and $I_2 + h\nu = I' + I$ was shown to take place by the same method, thus strengthening the interpretation placed upon the HgI_2 expts.

P. H. EMMETT

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

The effective cross section for the recombination of atoms with emission of radiation. A. TERENIN AND N. PRILEZHAEVA. *Physik. Z. Sowjetunion 2*, 337, 340 (1932). A general relation between the velocity const. of photodissocn. and recombination according to the scheme $h\nu + AB \rightleftharpoons A' + B$ is advanced. These consts. are k_r for the direct process and q_r for the reverse. This relation $q_r/k_r = (8\pi^2 l \mu^2 s)(g'g' \nu^2 - (8\pi^2 s)(g' \nu/g'\lambda)^2$ allows the effective cross section of the atom for interaction with radiation to be calcd. from the absorption coeff. and the reverse. g' and g are quantum wts. for the excited and non-excited states, s is the symmetry no., and the other symbols have their usual significances. On the basis of present data, the formation of a mol. from atoms with radiation of energy has been calcd. to have a very small probability ($10^{-4} - 10^{-9}$).

C. E. P. JEFFREYS

A.S.M.—S.L.A.   METALLURGICAL LITERATURE CLASSIFICATION

Quenching of thallium fluorescence by iodine molecules and atoms. N. PRILEZ HABVA. *Physik. Z. Sowjetunion* 2, 351–60(1932) —The quenching of the emission of the Tl line 5351 A. U. by I_2 and I was studied. The action of I_2 on Tl' is expressed by $Tl' + I_2 \rightleftharpoons TlI + I' + 74$ kg.-cal. with a velocity const. of 5×10^{-9} and effective cross section $q = 1.6 \times 10^{-14}$ sq. cm., q increases with the velocity of Tl' The quench ing by I atoms is considered as a transition from the potential curve $Tl'(^2S_{1/2}) + I(^2P_{3/2})$ to one of the repulsion curves, $Tl'(^2P_{3/2}) + I'(^2P_{1/2})$, $Tl(^2P_{1/2}) + I(^2P_{3/2})$ or $Tl'(^2P_{1/2}) + I(^2P_{3/2})$. The effective cross section for these processes is of the order of 10^{-16} sq. cm. and showed no marked dependence upon the velocity of the colliding particles. The intensity of the TlI fluorescence due to excitation in the range of 3800 A. U. did not

vary with I_2 pressure, showing the reaction $(TlI)' + I_2 = TlI_3 + I$ practically non-existent.
C. E. P. JEFFERYS

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

CP

Quenching of thallium fluorescence by thallium iodide molecules. N. PHILPS-HARYA. *Physik. Z. Sowjetunion* 3, 367–76(1932).—The quenching of the Tl line 5351 A. U. by collision of TlI mols. with excited Tl atoms produced by optical dissocn. of TlI was studied. The effective cross section for this process increased with the wave length of the exciting light from 5×10^{-16} to 1.5×10^{-14} sq. cm., i. e. with increase in velocity of the Tl atoms. The quenching is attributed to collisions of the second kind of Tl atoms with TlI mols.   C. E. P. JEFFREYS

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Quenching of atomic fluorine, the presence by foreign gases. J. W. S. and (Central Institute of metallurgy, USSR)...

Processed and properties index

Metallurgical Literature Classification

J. W. S.

Photodissociation of the vapors of some organometallic compounds A. Terenin and N. Prileshaeva. *Acta Physicochim. (U.S.S.R.) 1*, 759 (1934)(in English); *J. Phys. Chem. (U.S.S.R.) 5*, 1041, 1241(1934)(in Russian). *(C. A. 28, 5758).* The absorption spectra of the vapors of Hg(CH₃)₂, Zn(CH₃)₂, Pb(C₂H₅)₄, CH₃HgI and CH₃HgBr were studied in the range from the visible down to 1850 A. In all cases a continuous absorption was observed in the ultraviolet, which may be ascribed to the photodissociatn. of the mols. with the rupture of one of the C-metal bonds, e. g. hv + Hg(CH₃)₂ → CH₃ + HgCH₃. In the case of Hg(CH₃)₂ a diffuse band spectrum was also observed. The vapors of Zn(CH₃)₂ and Pb(C₂H₅)₄ at high pressures (1 atm.) are decompd. by ultraviolet light with the liberation of metal particles. For Zn(CH₃)₂ the effective light is from 2030 to 2130 with a broad max. at 2300 A. For Pb(C₂H₅)₄ the max. is near 3000 A. with a range to 2400 A. Decompn. is a stepwise process involving lower metal alkyls. When the vapors of the halogen derivs. cited above are illuminated by short ultraviolet light, band spectra belonging to HgI and HgBr, resp., are emitted. This shows that under the action of suitable quanta the mols. CH₃HgX are split up according to the scheme: hv + CH₃HgX →

CH₃ + HgX, where HgX is an excited mol. emitting its characteristic spectrum. The dissocn. energies calcd. from the spectral data are for the bond CH₃-Hg in CH₃HgI 40.31 Cal., in CH₃-Hg Br 65 Cal. and in CH₃-Hg 121 Cal., for Hg-Br 81 Cal. for Hg 128 Cal.

F. H. Rathmann

Fluorescence and absorption spectra of simple aromatic amines. N. Prilezhaeva and R. Chubarov. Acta Physicochim. U. R. S. S. 1, 777-84(1934)(in German).— Aniline vapor at from 0.05 to 8.0 mm on excitation by monochromatic light 2575 and 2800 A. shows only a diffuse structureless fluorescence spectrum in the region 2800 to 3800 A. Intensities of fluorescence are given for various exciting sparks from 2300 to 3000 A. with a max. at 2750 A. Diphenylamine shows fluorescence from 2800 to 3800 with a slight max. at 3300 A., excited by light in the region 2300-2800 with a max. at 2800 A. The two spectra for diphenylamine are shifted to the short-wave length side. The long-wave spectra are due to the benzene ring with deformation and shift due to the NH₂ and the N-H group, resp. The short-wave structure is ascribed to the NH₂ group. The N-H group gives a very diffuse structure only.   F. H. Rathmann

The anti-Stokes fluorescence of aniline vapor. N. Krukhcheva. *Acta Physicochim. U.R.S.S.* 1, 785 (1934) (in German).—"The ultraviolet fluorescence band of aniline vapor (2850-3900 A.) is excited by visible light and glass lenses in 0.1% the intensity given by Stokes excitation (2500-2900 A.)." A slight max. occurs at 3600, 3700 A. The intensity is proportional to the intensity of the exciting beam and increases with temp. up to 250°; then it falls and disappears at 350-400°. The energy difference between exciting limit and excited max. is about 1 volt. The structure of the spectrum is not changed by change of pressure or temp. From 2 to 10 mm. the intensity is approx. proportional to pressure, and is then const. up to 1 atm. Mixts. of aniline with indigo vapor show the possibility of a sensitized anti-Stokes fluorescence according to the equation: indigo* + aniline → aniline* + indigo.   F. H. Rathmann

Decomposition of lead tetraethyl in the glow discharge. M. A. PRILEZHAEVA (Compt. rend. Acad. Sci. U.R.S.S. 1944).—The emission spectrum contains radiation due to OH, C, H, and H. Spark lines of Pb are absent and the Pb arc spectrum is emitted at the decomp. of PbEt. It appears that the decomp. is due to slow electrons.

J. G. A. G.

The fluorescence spectrum of ethylamine vapor. A. V. Banov and N. A. Prileshaeva. (Comp. rend. acad. sci. (U.R.S.S.) 3, 407-5(In German 408-9)(1936). The spectrum was studied in the region 2700-3200 A. with pressures from 1 atm. down to the vapor pressure o' the liquid at −90°. Five broad bands shaded to the violet were found showing a frequency difference of 1470 cm.⁻¹. This is a Raman frequency associated with the CH₃ group. No predissocn. is observed and decompn. in the region of exciting light, 2800-2900 A., is unlikely.
A. B. F. Duncan

METALLURGICAL LITERATURE CLASSIFICATION